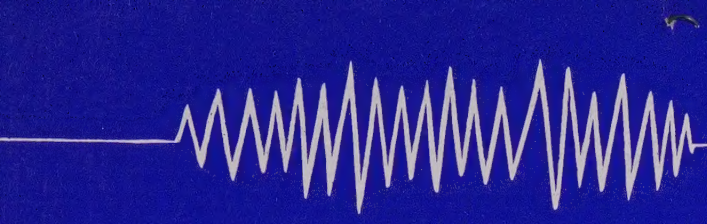

techni-rite

operations and service manual

TSC-810

techni-rite

ELECTRONICS

INCORPORATED

L-404

Operations and Service Manual

Model TSC-810 Signal Conditioner

Errata Sheet

Page	Change from	to
I-1	differential amplifier	buffer amplifier
II-1	uv sensitivity	mv sensitivity
IV-2	5 minutes warm-up	15 minutes warm-up
IV-3	4) 50 uv position	5V position
	5) 50-500 mv positions	5V-10 mv positions
	b.2) 5 minutes warm-up	15 minutes warm-up

L-404

OPERATIONS AND SERVICE MANUAL

MODEL TSC-810

SIGNAL CONDITIONER

for use with

TECHNI-RITE Model TR-888
Eight Channel Recorder

TECHNI-RITE Model TR-444
Four Channel Recorder

TECHNI-RITE Model 7100
Single Channel Recorder

TECHNI-RITE ELECTRONICS, INC.
Techni-Rite Industrial Park
East Greenwich, R. I. 02818

WARRANTY

TECHNI-RITE warrants each instrument to be free from defects in material and workmanship. Our liability under this warranty is limited to servicing or adjusting any instrument returned to the factory for that purpose, and replacing any defective parts thereof (except pens, tubes, fuses, and batteries). This warranty is effective for one year after delivery to the original purchaser, if the instrument is returned, transportation charges prepaid by the original purchaser, and upon our examination, proves to be defective. If the defect has been caused by misuse or abnormal conditions of operation, repairs will be billed at our current rate. In this case, an estimate will be submitted before the work is started. This warranty is in lieu of all other warranties, expressed or implied.

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II.	Installation	II-1
III.	Operation	III-1
IV.	Principles of Operation	IV-1
V.	Preventive Maintenance	V-1
VI.	Troubleshooting	VI-1
VII.	Parts List	VII-1
VIII.	Schematics & Illustrations	VIII-1
IX.	Accessories	IX-1

LIST OF ILLUSTRATIONS

	DWG. #
Assembly, Input Circuit	401127
Schematic, Input Circuit	401130
Assembly, Input Circuit Module	401134
Photo of TSC-810, Front Panel Controls	
Photo of TSC-810, Signal Conditioner	

I. DESCRIPTION OF EQUIPMENT

A. Introduction

The Model TSC-810 Signal Conditioner Module can be used interchangeably with the TR-888, TR-444, and TR-7100 model recorders. The TSC-810 accepts AC and DC signals up to 200 volts full scale.

The TSC-810 front panel controls include:

1. Gain Control--The gain control is a potentiometer across the output of the differential amplifier which controls the amount of signal to the pen motor.
2. Position Control--The position control is a potentiometer across the - and + power supplies. The output from the potentiometer is fed to the pen motor. Stylus position is affected by turning the position control in the desired direction.
3. Attenuator Switch--The attenuator control allows selection of the desired sensitivity and calibration and also isolates the signal conditioner in the OFF position.
4. Vo Adjustment--The Vo adjustment is a screwdriver potentiometer adjustment which compensates for voltage offsets in the TSC-810.

B. Specifications, TSC-810

1. Sensitivity: 10 mv/div., nominal
2. Input Configuration: 500K ohms (± 2%) single-ended, floating.
3. Linearity: ± 1% of full scale (for input voltage up to ± 250 mv)
4. Attenuator Switch
   a. Position: 9 active from 10 mv/div. to 5 V/div.
   b. Ratio Accuracy: ± ½% typical; ± 1% maximum
   c. Other Positions: OFF, CAL

5. Baseline Drift:
   a. 0.2 div./8 hr. typical; 0.5 div./8 hr. maximum
   b. 0.2 div./10°C typical; 0.5 div./10°C maximum
6. Rise Time
   a. TR-888--4 to 5 msec for 5 mm peak to peak stylus deflection
   b. TR-444--4 to 5 msec for 5 mm peak to peak stylus deflection
   c. TR-7100--50 msec for full scale peak to peak stylus deflection
7. Recovery Time
   a. TR-888 20 msec (maximum)
   b. TR-444 20 msec (maximum)
   c. TR-7100 40 msec (maximum)
8. Position Adjustment
   ± 27 Div. (Minimum)
   Note: Mechanical stylus limits are pre-set at factory between ± 26 and ± 27 Div.
9. Vibration: 3 g's at 2 to 100 hz

C. Specifications, TSC-810, with Recorder
1. Linearity: ± ¼ div.
2. Hysteresis: 0.1 div. maximum
3. Frequency Response with 1 ± ½ div. overshoot

   The frequency response of the amplifier/pen motor combination is limited by the mass of the pen motor drive coil and associated stylus and varies for each system application as follows:
   a. TR-888
      1) DC to 30 Hz, 50 div. peak to peak, ± 1 db
      2) DC to 60 Hz, 20 div. peak to peak, ± 1 db
      3) DC to 125 Hz, 10 div. peak to peak, - 3 db
   b. TR-444
      1) DC to 30 Hz, 50 div. peak to peak ± 1 db
      2) DC to 60 Hz, 20 div. peak to peak ± 1 db
      3) DC to 100 Hz, 5 div. peak to peak - 3 db

c. TR-7100

1) DC to 10 Hz, 50 div. peak to peak ± 1 db

2) DC to 18 Hz, 50 div. peak to peak - 3 db

4. Calibration Voltage: set at 200 mv ± ½ mv

a. Accuracy: ± 1% for 6 months

b. Minimum Adjustment: ± 200 mv

5. Power Requirement: 115 V ± 10 V AC 50 Hz or 60 Hz, 6-watts

6. Power Supply (± EBB):

a. Output Voltage: ± 14.1 VDC minimum; ± 16.7 VDC maximum

b. Output Current: 2 ma to 250 ma

c. Output Ripple Voltage:

1) 125 mv RMS maximum at 250 ma load and 105 VAC line

2) 20 mv RMS at 250 ma load and 125 VAC line

3) 20 mv RMS at 2 ma load and 105 VAC line.

d. Load Regulation: 2.5% from 2 ma to 250 ma load change with constant line voltage

e. Line Regulation: 1% change per 10 VAC change in line voltage at constant load

7. Operating Temperature Range: 0° to 50°C ambient

8. Duty Cycle: Continuous for normal operation

9. Life (MTBF): 10,000 hours minimum for normal operating conditions

10. Rise Time

a. TR-888 and TR-444: 4 to 5 msec for 5 mm peak to peak stylus defection

b. TR-7100: 50 msec for full scale peak to peak stylus deflection

11. Recovery Time

a. TR-888 and TR-444: 20 msec (maximum)

b. TR-7100: 40 msec (maximum)

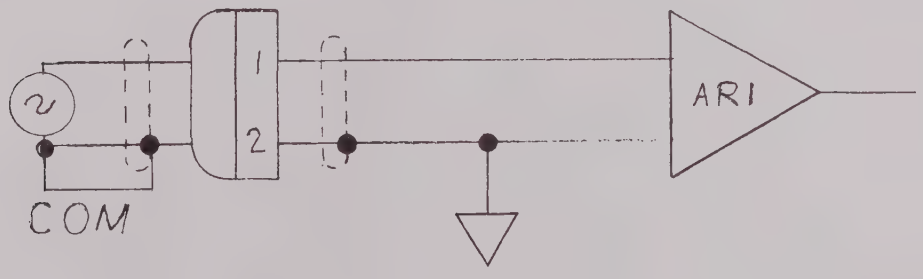
12. Io Offset
    a. 0.1 div. typical
    b. ¼ div. maximum
13. Vo Adjustment: Set to within 0.1 div., (± 3 div. adjustment minimum)
14. Noise:
    a. .1 div. typical
    b. 0.2 div. maximum

II. INSTALLATION

The TSC-810 Signal Conditioner is designed for ease of installation. Hold the unit upright in one hand and carefully insert the PC board edge of the conditioner into the two slides on the recorder. Push the conditioner fully in until the PC board is inserted into the connector and the module is flush with the front panel of the recorder. The conditioner is then properly in place.

A. Signal Wiring Connections

The TSC-810 is a sensitive signal conditioner in respect to its uv sensitivity and must be wired accordingly. Shielded cable should be used from the input connector to the desired source of signal input. The positive side of the signal should be connected to pin 1. The shield should be connected to the signal common at the signal source to prevent any noise from affecting the signal level. Connect the signal source common to a good earth ground, which will generally reduce 60-cycle noise pickup. The signal cable should be 4 to 6 feet long in order to reduce noise pickup.



SIGNAL INPUT CONNECTIONS

III. OPERATION

A. General Procedure

For all Signal Conditioner calibration procedures, set up Basic Recorder controls as follows:

1. Turn MAIN POWER, ON. Allow 15 minutes warmup.
2. Set CHART SPEEDS selector to 1 or 5 mm/sec. or approximate equivalent.
3. Adjust TRACE WIDTH control for a fine trace.
4. Refer to Specific Procedures below.

B. Specific Procedure, Model TSC-810

1. Turn round locking knobs on GAIN and POSITION controls counterclockwise 1/2 to 2/3 turn to unlock controls, then turn each locking knob clockwise until GAIN and POSITION controls are partially restrained from rotating.
2. Turn GAIN control fully counterclockwise.
3. Using POSITION CONTROL, set trace drawn by Recorder Stylus precisely to the center line of its channel.
4. Turn GAIN control fully clockwise; if the Stylus moves from its center position by more than 2/5 of the smallest chart division, reset it to channel center line by means of the screwdriver adjustment Vo trimmer located behind its front panel access hole, marked "Vo".
5. Set Function Switch to CAL (calibrate) position. Set GAIN control to the position which causes the Stylus to trace a line precisely 20 smallest chart divisions to the right of channel center.
   NOTE: 20 divisions are not equivalent to End Scale deflection, which is 25 divisions.

6. Return Function Switch to the OFF position and verify that the Stylus is tracing a line at exactly channel center; correct if necessary by means of the Position control.
7. Repeat steps 5 and 6 until Stylus traces precisely at channel center in OFF and at +20 chart divisions in the CAL position of the Function Switch.
8. The Signal may now be connected to the Signal Conditioner per Wiring Instructions given in Chapter II. The Position control and Function Switch may now be set at any position within their respective ranges of adjustment.

IV. PRINCIPLES OF OPERATION

The Model TSC-810 Signal Conditioner conditions the input signal and controls the stylus in the particular channel that it is used in the recorder. The TSC-810 consists of the following circuitry:

A. Signal Input

The module signal input presents a constant 500 K load to the signal throughout the nine available attenuator positions located on position 3 through 11 of the FUNCTION switch. On the circuit board "side" of the attenuator, the initially conditioned signal, referenced against common, passes through protective resistor R7 to the protective input damping zener diodes CR2 and CR3, which effectively limit the maximum signal voltage seen by input pair Q1 to a safe value in case of a severe accidental overload at the input of the attenuator, in which case the excessive signal voltage would be dropped across R7.

Q1, the input pair, is connected in the now classical Darlington configuration to present a very high (30 to 50 megohms) load to the input attenuator, to keep attenuator loading to a minimum, and to maintain accurate attenuator ratios. Q1 is a single-chip pair, with excellent temperature characteristics. This portion of the circuit, consisting of Q1, R4, R6, R8, and R9 has a voltage gain of unity. The purpose of R9, the front-panel accessible Vo control, is to maintain a zero-input zero-output condition. R4 is a resistor selected to reduce the Io leakage out of the base of the first transistor in Q1 to a level which will cause less than 0.2 divisions of stylus shift when switching the FUNCTION switch through its range, (equivalent to 2 mv at input). The Io is essentially a constant-current flow, and would otherwise produce a false "signal" at the input of Q1 equivalent to the Io current multiplied by the resistive value of the attenuator seen by Q1, which varies between 1 K ohm and 500 K ohms as the FUNCTION switch is rotated through its range.

B. Power Supply

The center-tapped secondary of a power transformer feeds a full-wave bridge rectifier module, CR6, whose output gives a positive and a negative voltage with respect to the transformer center tap (P.C. board common). This unfiltered DC output is smoothed by electrolytic capacitors C1 and C2 and

then passes to the series regulators Q2 and Q3. The positive voltage regulator, consisting of CR5, R11, and Q3 is assembled into the simplest series regulator, closely akin to an emitter follower whose base input voltage and emitter output voltage is set and fixed by zener diode CR5. CR5 is supplied with current through dropping resistor R11 from the unregulated voltage supplying the collector of Q3. CR5 is a 16 volt, 5% zener, rated at one watt. The net output voltage is 16 volts less 0.6 volt emitter-to-base drop in Q3, or 15.4 volts ±5%.

C. Calibration Circuit

The calibration voltage circuit comprises R5, CR1, R1, R2, and R3. Reference zener CR1, a 9-volt unit is connected to the regulated positive voltage supply through R5. This doubly-regulated voltage, available at the junction of R1 and CR5 is fed to a voltage divider string consisting of R1, R3, and trimmmer potentiometer R2. The output of R2, derived from its slider, is adjustable over a narrow range around 200 mv, the nominal calibration voltage. This calibration voltage signal is connected to position number 2 of the FUNCTION switch.

D. Stylus Position Control Circuit

The stylus position control potentiometer is connected between the +15.5 and -15.5 V busses on the PC board and the slider of this control is connected directly to the position input of the integrated amplifier pen motor.

E. Gain Control Circuit

The gain control potentiometer is connected between the output of Q1 and PC board common. Since the sensitivity of the integrated amplifier pen motor is equal to approximately 8 millivolts per chart division, and since Q1 has a gain of one (1), the rated senstivity of the system (10 millivolts per chart division) is attained when the slider is stationed at approximately 75% of its full scale (270°) rotation. The control slider is connected directly to the signal input lead of the integrated amplifier pen motor.

F. Calibration and Vo Adjustment

1. Vo Adjustment
   a. Equipment--narrow screwdriver
   b. Procedure
      1) Plug the TSC-810 into the recorder.
      2) Push the MAIN POWER switch ON and allow 5 minutes warm-up time. Turn CHART SPEED switch to 5 or 10 mm/sec.

3) Place a jumper between the plus (+) signal and common input on the particular channel in use, and adjust the POS control for chart center.
4) Switch the ATTENUATOR switch to the 50 uv position and check the stylus position. If the stylus is not at chart center, adjust Vo (R9) until the stylus is exactly at chart center.
5) Step through the 50-500 mv positions and check for stylus position. If the stylus cannot be adjusted to less than 0.1 division of chart center on all ranges, replace Q1.

2. CAL Adjustment
   a. Equipment
      1) Digital Voltmeter ±0.1%
      2) Narrow screwdriver
      3) Extender card
   b. Procedure
      1) Plug TSC-810 into the extender card and insert the assembly into the recorder.
      2) Push MAIN POWER ON and allow 5 minutes warm-up time.
      3) Connect the plug (+) lead of the DVM to TP7 and the negative lead to TP10.
      4) Adjust R2 until the DVM is reading 200 (±1) mv.

V. PREVENTIVE MAINTENANCE

A. Periodic Maintenance - Mechanical Check

These TSC checks are generally recommended every 500 hours of operation or every three to six months, as determined by experience. They may also be used for preliminary troubleshooting. See Section 1 Specifications.

1. Preliminary

Turn OFF all power to the recorder. Remove the signal conditioner by grasping the top and bottom black knobs and then pulling the signal conditioner straight out.

2. Cleaning

Blow out dust and dirt with an air hose. Inspect for foreign particles. Clean the preamplifier panel and knobs with a moist cloth, then wipe dry with a soft, dry cloth. Occasionally rotate each knob through its full scale. This keeps all contacts clean.

3. Inspect for Tightness

Inspect the signal conditioner and power supply for loose transistors, plug-in components, resistors, capacitors, controls, terminal boards, mounting boards, rectifiers, fuses, transformers, etc. Check that all panel-mounted components are securely in place, that all locking controls will lock securely, and that each knob is tight on its shaft.

4. Inspect for Damage

Inspect visually and by smell for burned or worn insulation, leakage, or damaged resistors, capacitors, transformers, etc. Inspect also for corrosion, rust, and electrical or mechanical abuse.

5. Replace

Reinstall the equipment and fasten securely.

VI. TROUBLESHOOTING (TSC-810)

SYMPTOMS	CHECK (DWG. 401130)
No Position, No Output	1. Channel fuse 2. Board connection 3. Power supply a. The output of CR6 is approximately 45 VDC; and if not, check CR6, C1 and C2. b. TP8 to TP10 should be +16 VDC; if not, check CR5, R11, and Q3. c. TP9 to TP10 should be -16 VDC; if not, check CR4, R10, and Q2. 4. If problem still persists, check amplifier circuitry for shorts on the TSC-810 and on the recorder.
Position but no Output	1. TP6 to TP3, if no signal, check connections and CR2 and CR3. 2. TP5 to TP10, if no output, check Q1 and associated circuitry. 3. TP2 to TP10, if no signal, check GAIN potentiometer.
Output but no Position	R111 for open
Noise on left side	1. TP9 to TP10 with oscilloscope for AC ripple; if ripple exceeds specifications, check C2 and CR4. 2. Input clamps CR2 and CR3.
Noise on Right side	1. TP8 to TP10 with oscilloscope for AC ripple; if ripple exceeds specifications, check C1 and CR5. 2. Input clamps CR2 and CR3.
Unable to adjust CAL	CR1, R1, R2, and R3.

VII. PARTS LIST

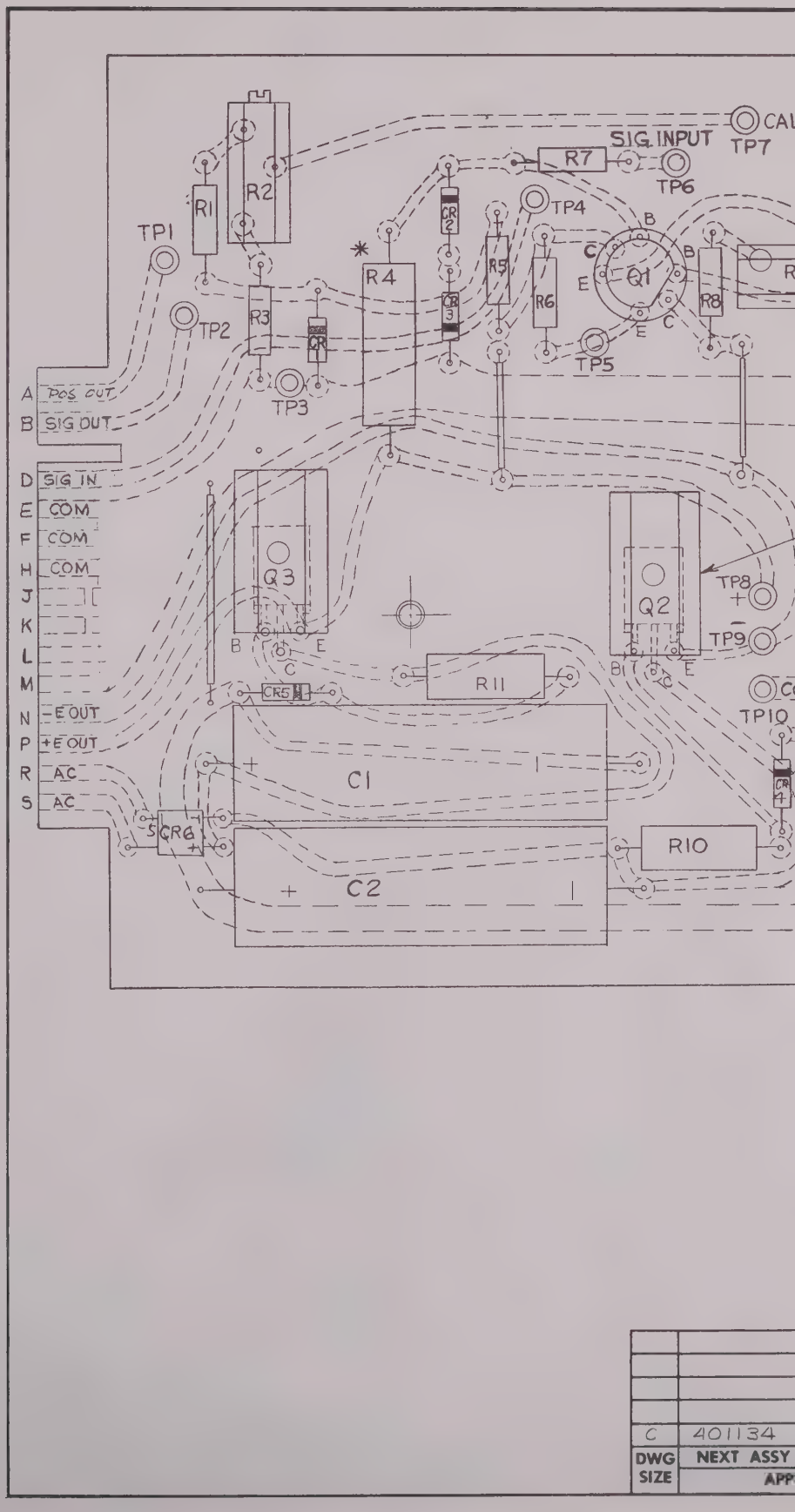
Parts lists are compiled by assembly or subassembly. They are listed first by reference designation in alphanumeric order and then alphabetically by nomenclature. To the right of each nomenclature or part name is the manufacturer (Techni-Rite or otherwise), manufacturer's part number, and then TECHNI-RITE part number which every part has. Manufacturer's part name and number are given in the PARTS LIST when available. However, it is sometimes more expedient and less expensive to obtain the part locally. Sometimes a part (such as a resistor, where its value is known) may even be available in the customer's own stock of supplies.

Ref. Desig.	DWG. 401127 DWG. 401130 Description	Techni-Rite Part No.	Mfr.	Mfr. P/N	Units per Ass'y.
C1, C2	Capacitor 530VF	104131	Richey Elec.	-	2
CR1	Diode Ref. 9V	104154	Motorola	IN935	1
CR2,CR3	Diode Zener 7.5V	104679	*	-	2
CR4,CR5	Diode Zener 7.5V	101968-16	*	-	2
CR6	Diode Bridge	106080-2	Motorola	MDA920A-2	1
Q1	Transistor Dual	104468	Sprague	TD601	1
Q2	Transistor PNP	103846	Motorola	2N4919	1
Q3	Transistor NPN	103833	Motorola	2N4922	1
R1	Resistor 51.1K	100549-5112	*	-	1
R2	Potentiometer 500 ohms	103954-501	Beckman Heli.	77PR	1
R3	Resistor 1K	100549-1001	*	-	1
R4	Resistor 300 Meg	101880-307	Res. Prod. Co.	BAEW	1
R5	Resistor 698 ohms	100549-698R	*	-	1
R6	Resistor 49.9 K	100549-4992	*	-	1
R7	Resistor 100 K	100550-1003	*	-	1
R8	Resistor 1 meg	100549-1004	*	-	1
R9	Potentiometer 20 K	103954-203	*	-	1
R10,R11	Resistor 180 ohms	100558-181	*	-	2
	Switch, Rotary	1-103641	Mallory	4M 11111	1
R101	Resistor 249 K	100549-2493	*	-	1
R102	Resistor 150 K	100549-1503	*	-	1
R103	Resistor 49.9 K	100549-4992	*	-	1
R104	Resistor 24.9 K	100549-2492	*	-	1
R105	Resistor 15 K	100549-1502	*	-	1
R106	Rrsostor 4.99 K	100549-4991	*	-	1
R107	Resistor 2.49 K	100549-2491	*	-	1
R108	Resistor 1.5 K	100549-1501	*	-	1
R109	Resistor 1 K	100549-1001	*	-	1
R110, R111	Potentiometer Input Circuit Assembly	102008-503 401127	Clarostat Mfg.	- -	

Note: All Resistors Part No. 100549 are 1% ¼ WMF
100550 are 1% ½ WMF
100558 are 5% 1 WCC
101880 are ±10% p.5 WCC

* See your local distributor.

VIII. SCHEMATICS AND ILLUSTRATIONS



C	401134
DWG SIZE	NEXT ASSY
	APP

REVISIONS				
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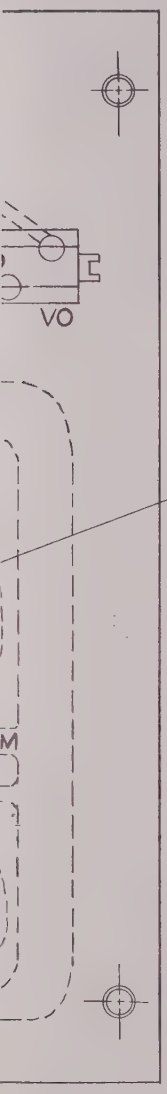
	B	FIND #14 WAS 103533	29 DEC 69	20701



USE SILICONE GREASE BETWEEN H.S. AND TRANSISTORS. PLASTIC WASHER (SUPP'D WITH TRANS.) TO BE USED ON ETCHED SIDE OF BD.

*R4 SHALL BE SELECTED AT TEST TO REDUCE EXCESSIVE Io SHIFT

DWG SIZE	CODE IDENT	SPECIFICATIONS	SYMBOL	QUAN REQ	FIND NO.	PART NO. OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
			—	AR	25	—	SILICONE GREASE
			PC1	1	24	104704	PC BOARD
			—	X	23	401130	SCHEMATIC
			—	2	22	—	CUP WASHER (SUPPLIED WITH POWER TRANSISTOR)
				1	21	104305	TRANSISTOR SPACER
			—	2	20	1/4" LONG	4-40 PHILLIPS HD. SCRW.
			—	2	19	104613	HEAT SINK
			C1,C2	2	18	104131	CAPACITOR 530 UF 25V
			Q3	1	17	103833	TRANSISTOR NPN 2N4922
			Q2	1	16	103846	TRANSISTOR PNP 2N4919
			Q1	1	15	104468	TRANSISTOR DUAL
			CR6	1	14	106080-2	DIODE BRIDGE
			CR4,CR5	2	13	101968-16	DIODE ZENER 16 V
			CR2,CR3	2	12	104679	DIODE ZENER 7.5 V
			CR1	1	11	104154	DIODE REF. 9 V
			R10,R11	2	10	100558-181	RESISTOR, 1 W CC 180 Ω
			R9	1	9	103954-203	POT 20 K
			R8	1	8	100549-1004	RESISTOR, 1/4 W MF 1 MEG
			R7	1	7	100550-1003	RESISTOR, 1/2 W MF 100 K
			R6	1	6	100549-4992	RESISTOR, 1/4 W MF 49.9 K
			R5	1	5	100549-698R	RESISTOR, 1/4 W MF 698 Ω
			R4	1	4	101880-307	RESISTOR CARBON F. 300 MEG.
			R3	1	3	100549-1001	RESISTOR, 1/4 W MF 1 K
			R2	1	2	103954-501	POT. 500 Ω
			R1	1	1	100549-5112	RESISTOR, 1/4 W MF 51.1 K

PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES:
TOLERANCES ON:
FRACTIONS ± 1/64 | TWO PLACE DECIMALS ± .010
ANGLES ± 1° | THREE PLACE DECIMALS ± .005
REMOVE ALL BURRS AND SHARP EDGES. DIMENSIONS AND TOLERANCES SHALL BE HELD AFTER PLATING. 63 MACHINE SURFACES TO BE √ RMS.
MATERIAL —"—

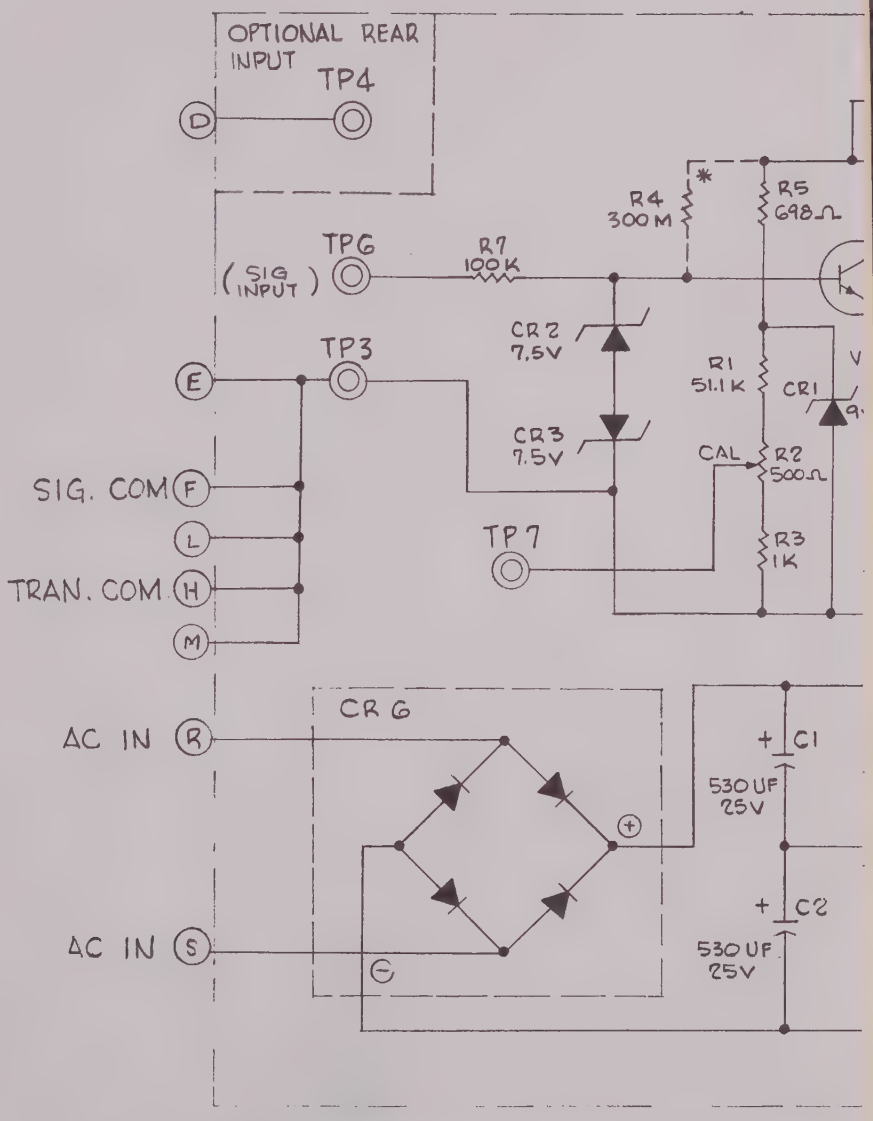
DRAWN BY: D.E. MILLER 10-1-69 DATE
CHECKED BY: J.F. CAYER 2 OCT. 69
CONTRACTOR CERTIFICATION:
DESIGN APPROVAL:
DOCUMENTATION APPROVAL:

Gulton technI-rite® ELECTRONICS INCORPORATED

ASSY, INPUT CKT. (TSC-810)

SIZE C | CODE IDENT | DWG NO. 401127
SCALE 2/1 | CONTRACT NO. - | SHEET 1 OF 1

TSC-810
USED ON
CATION



* SELECTED AT TEST WHEN NECESSARY

IO SHIFT	R4 (CARBON FILM OR COMPOSI
2 TO 4 mv	600 MEG. OHM
4 TO 6 mv	300 MEG. OHM
6 TO 8 mv	250 MEG OHM
8 TO 10 mv	200 MEG. OHM
10 TO 12 mv	180 MEG. OHM

C	401134
DWG SIZE	NEXT ASSY
	APP.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
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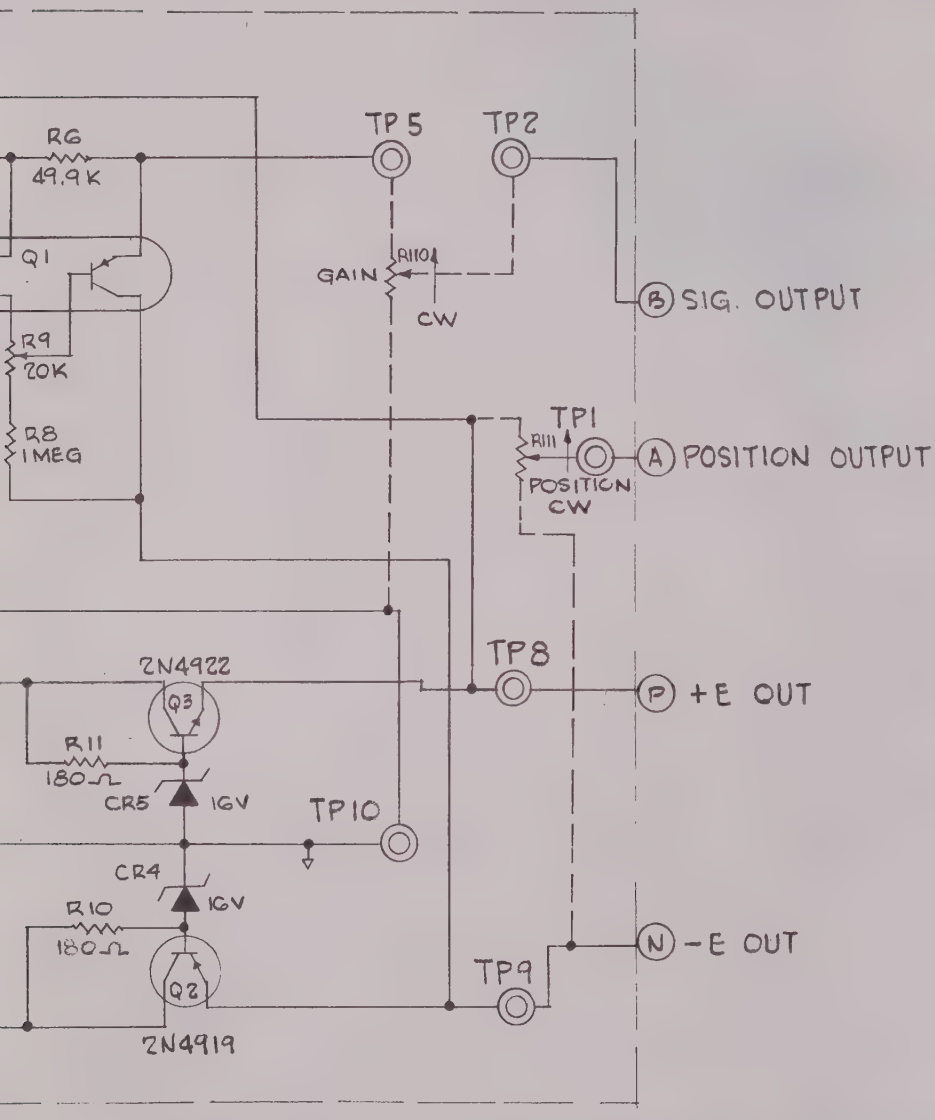
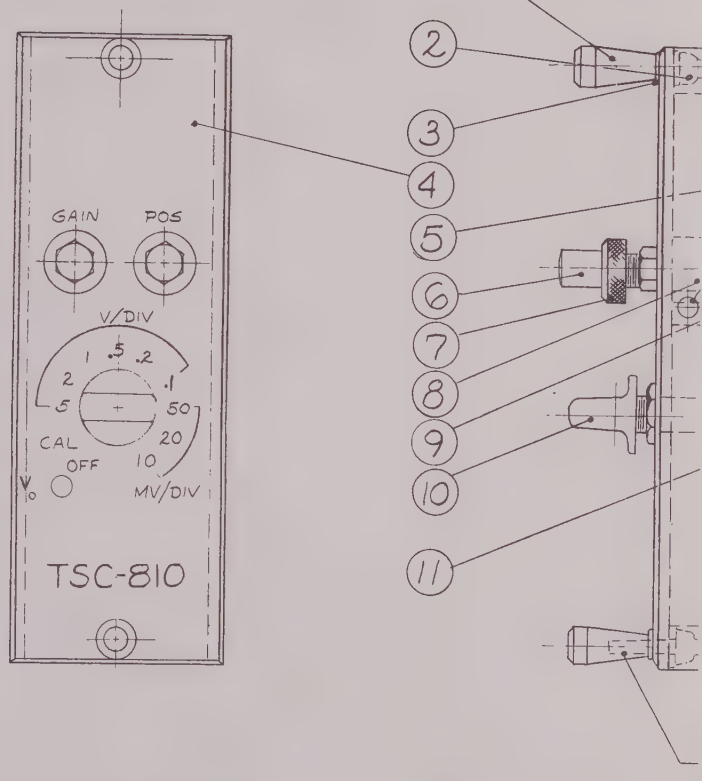
	C	ADDED R111 & R110 DESIGNATIONS P.A.L.	1 MAY 70	20171



DWG SIZE	CODE IDENT	SPECIFICATIONS		QUAN REQ	FIND NO.	PART NO. OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
			PARTS LIST				

UNLESS OTHERWISE SPECIFIED	DRAWN BY:	DATE	Gulton technirite® ELECTRONICS INCORPORATED
DIMENSIONS ARE IN INCHES: TOLERANCES ON: FRACTIONS ± 1/64 · TWO PLACE DECIMALS ± .010 · ANGLES ± 1° · THREE PLACE DECIMALS ± .005	N.WATSON	9-31-69	
REMOVE ALL BURRS AND SHARP EDGES. DIMENSIONS AND TOLERANCES SHALL BE HELD AFTER PLATING. 63 MACHINE SURFACES TO BE √ RMS.	CHECKED BY: J.F. CAYER	1 OCT 69	SCHEMATIC, INPUT CIRCUIT
MATERIAL — //	CONTRACTOR CERTIFICATION:		
	DESIGN APPROVAL:	SIZE C · CODE IDENT · DWG NO. 401130	
	DOCUMENTATION APPROVAL:	SCALE — // · CONTRACT NO. · SHEET 1 OF 1	

TSC-810
USED ON



E	600900
DWG SIZE	NEXT ASSY
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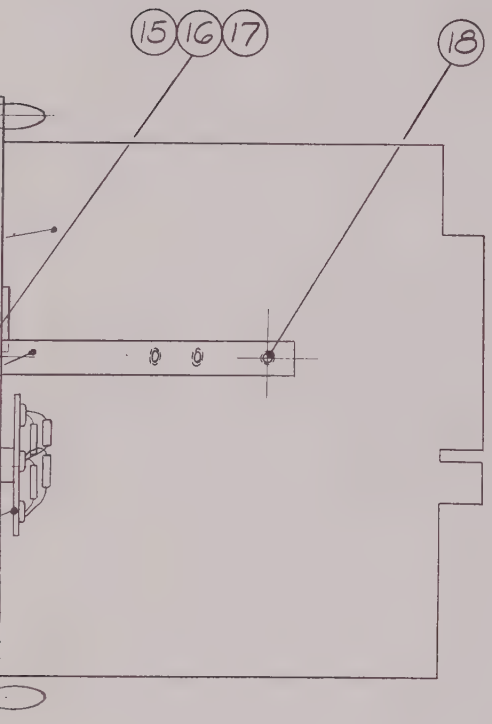
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	C	REDRAWN	9-31-69	
	D	ADDED FIND 20	7/2/71	



NOTE:
MODULE TO BE ALIGNED IN FIXTURE
FOR PROPER FIT IN RECORDER

(12) APPLY LOCTITE ON BOTH PLUGS

QUAN REQ	FIND NO.	PART NO. OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
1	20	401945	CABLES TSC-810 AMP
X	19	401132	SCHEMATIC
1	18	#4-40 x 1/4	RD. HD. SCREW - PHILLIPS
4	17	#4-40	LOCKWASHER
4	16	#4-40	HEX. NUT
3	15	#4-40 x 1/4	FL. HD. SCREW - PHILLIPS
	14		
	13		
X	12	———	LOCTITE BRG SER KIT # 113
1	11	200751-2	ATTEN. ASS'Y.
1	10	103575	KNOB
1	9	104681	STRAP
2	8	102008-503	POTENTIOMETER
2	7	102024	SHAFT LOCK
2	6	102023	KNOB
1	5	401127	INPUT CIRCUIT ASS'Y
1	4	A-401095	FRONT PANEL
2	3	104706	NYLON WASHER
2	2	104707	BANANA PLUG
2	1	104705	KNOB - MODULE

PARTS LIST

DWG SIZE	CODE IDENT	SPECIFICATIONS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES:
TOLERANCES ON:
FRACTIONS ± 1/64 | TWO PLACE DECIMALS ± .010
ANGLES ± 1° | THREE PLACE DECIMALS ± .005
REMOVE ALL BURRS AND SHARP EDGES. DIMENSIONS AND TOLERANCES SHALL BE HELD AFTER PLATING. 63 MACHINE SURFACES TO BE √ RMS.
MATERIAL

DRAWN BY: R.W. UPTON DATE 31SEP69
CHECKED BY: J. F. CAYER 1 OCT 69
CONTRACTOR CERTIFICATION:
DESIGN APPROVAL:
DOCUMENTATION APPROVAL:

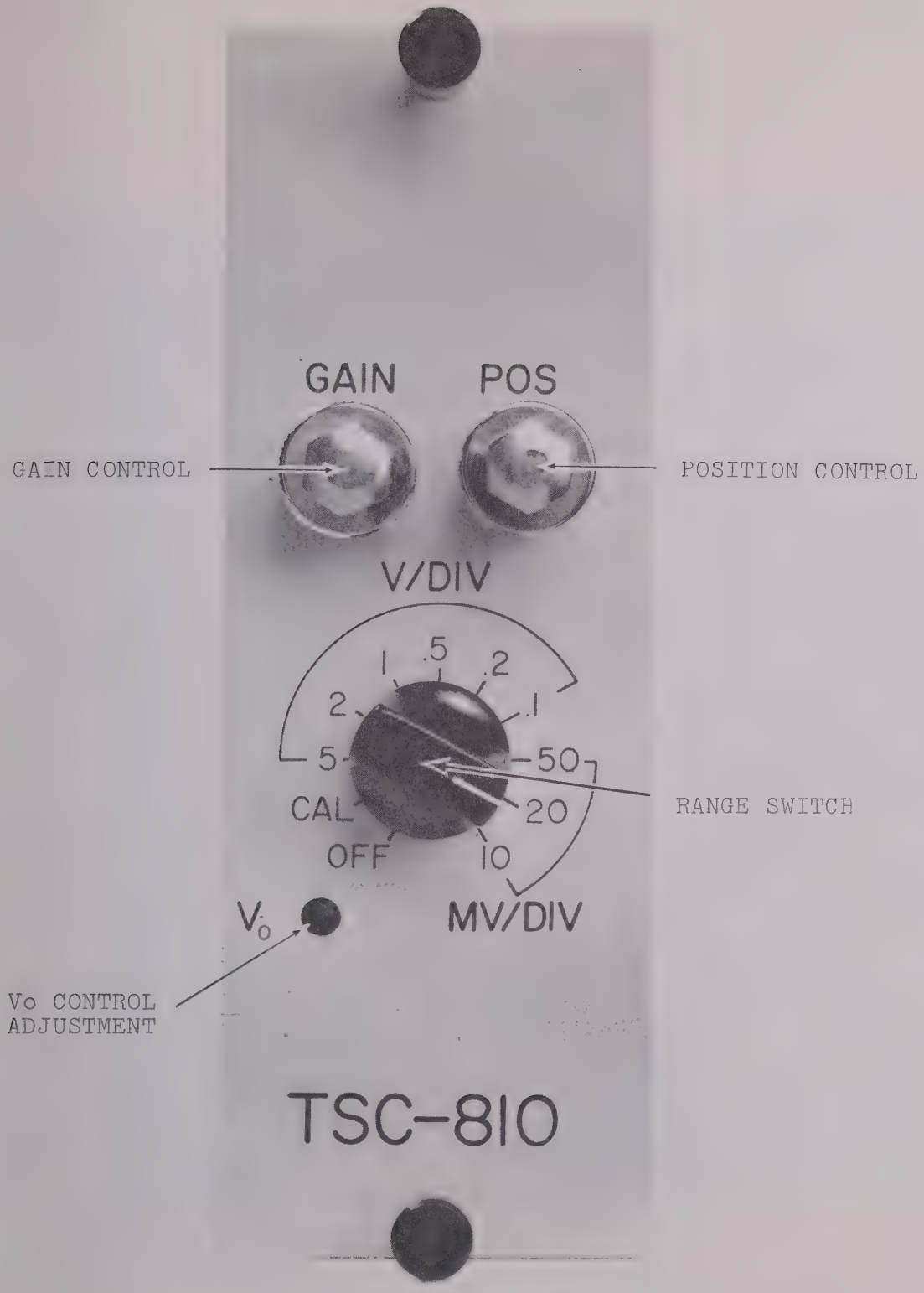
Gulton technni-rite® ELECTRONICS INCORPORATED

ASS'Y - INPUT CIRCUIT MODULE (TSC-810)

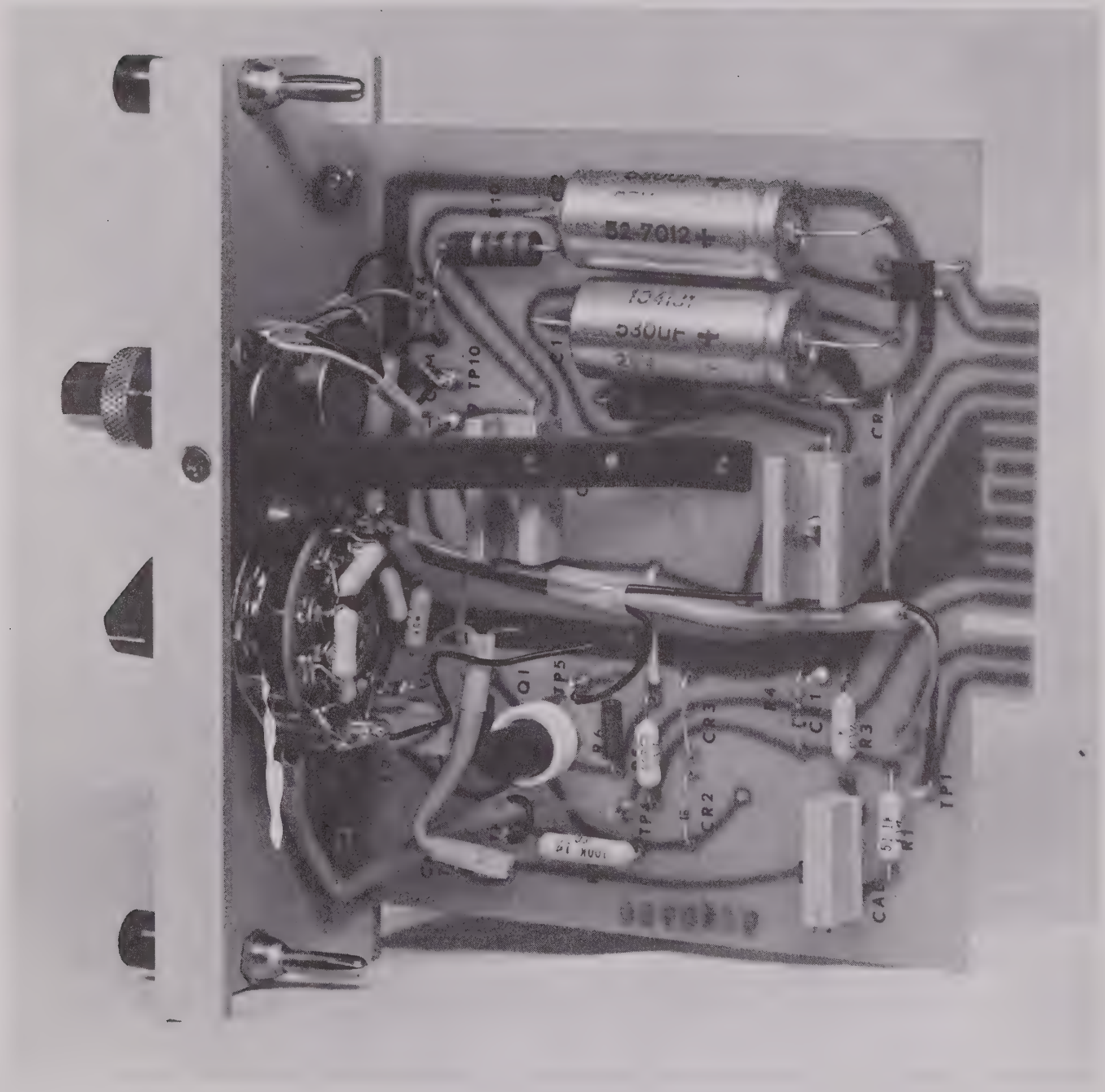
SIZE	CODE IDENT	DWG NO.
C		401134

SCALE	CONTRACT NO.	SHEET
1 : 1		1 OF 1

TR-888
USED ON
ATION



Model TSC-810, Front Panel Controls

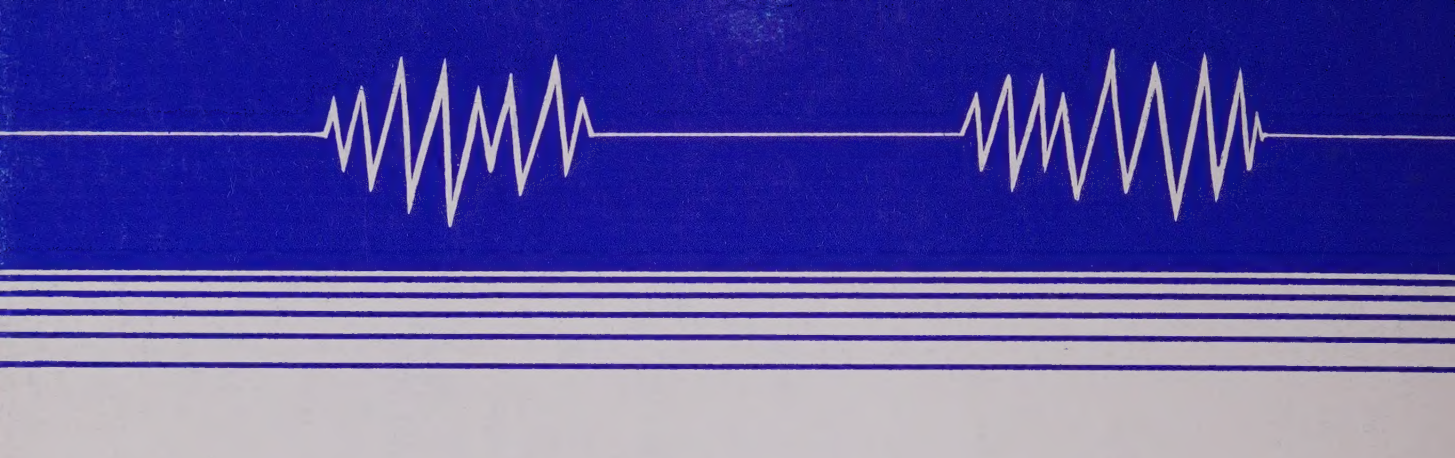


Model TSC-810, Side View

IX. ACCESSORIES

The following options and accessories are available:

A.	Left-hand event marker	Mod. TAC-120
B.	Chart rewinder	Mod. TAC-169
C.	Rack adaptor kit	Mod. TAC-170
D.	Custom formica protective case	Mod. TAC-179
E.	Special starter kit	Mod. TAC-166
F.	Extender card	Mod. TAC-130
G.	One second timer	Mod. TAC-168
H.	DC power inverter	Mod. TAC-178



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ELECTRONICS INC.

EAST GREENWICH, RHODE ISLAND